



(11) Publication number : **0 590 861 A2**

(12) **EUROPEAN PATENT APPLICATION**

(21) Application number : **93307492.4**

(51) Int. Cl.<sup>5</sup> : **G07F 7/08, G06F 15/30**

(22) Date of filing : **22.09.93**

(30) Priority : **29.09.92 US 953418**

(43) Date of publication of application :  
**06.04.94 Bulletin 94/14**

(84) Designated Contracting States :  
**AT BE CH DE ES FR GB IT LI NL SE**

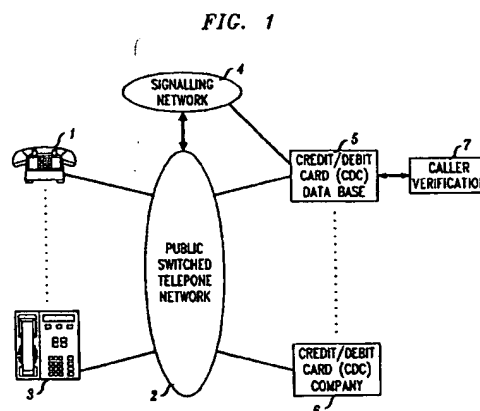
(71) Applicant : **AMERICAN TELEPHONE AND  
TELEGRAPH COMPANY**  
32 Avenue of the Americas  
New York, NY 10013-2412 (US)

(72) Inventor : **Colbert, Raymond Otto**  
1869 Golf Drive  
Naperville, Illinois 60565 (US)

(74) Representative : **Buckley, Christopher Simon  
Thirsk et al**  
**AT & T (UK) LTD., AT & T Intellectual Property  
Division, 5 Morningside Road  
Woodford Green, Essex IG8 0TU (GB)**

(54) **Secure credit/debit card authorization.**

(57) This invention relates to methods for making a credit/debit card purchase without revealing the card number to the vendor (3) of services or goods. The card holder (1) is connected to a data base (5) and provides the card number, plus holder identity verification, to the data base. The data base then verifies whether the card holder is authorised to incur the expense of the purchase, and, if so, provides an authorisation indication or code to the vendor (3); the card number cannot be derived from the authorisation information, thus helping to preserve the secrecy of the card number.



### Technical Field

This invention relates to a method for authorizing a credit/debit card holder to purchase goods or services.

### Problem

In recent years, telephone ordering of merchandise has become an increasingly common method of purchase. In a typical transaction, a caller calls a store, indicates the merchandise that is to be bought, provides his/her address for the delivery of the merchandise, and provides a credit/debit card (CDC) number. The vendor verifies that the CDC is valid and charges the purchase to that CDC. The vendor then sends the merchandise to the customer. A problem of this method of operation is that the customer must provide his/her CDC number to the vendor. This tends to compromise the secrecy of the CDC number which makes possible the fraudulent use of such a number. The possibility of such fraudulent use helps to keep the rates charged by credit card companies to the vendors high, and limits teletransaction usage.

### Solution

In accordance with applicant's invention, an advance is made over the methods of the prior art by connecting a customer desiring to order merchandise to the data base of a CDC company or to its authorized agent such as a common carrier; the caller then provides the CDC number to the data base, which after checking the authorization of the CDC number, provides an authorization indication to a vendor. The vendor charges the credit card company for the purchase using the authorization code. Advantageously, the credit card number is only provided to the credit card company or carrier, not to the vendor.

In accordance with one feature of the invention, identification methods are used to identify the caller and only provide authorization for the purchase (transaction) if the caller is the owner of the CDC. In one specific embodiment of the invention, the caller is identified using voice recognition. Alternatively, or in addition, a personal identification number is used. Alternatively, or in addition, the caller is identified using automatic number identification (ANI) which is forwarded to the card company or agent as part of the caller identification.

In accordance with one feature of the invention, the authorization indication comprises an authorization code for tracking a purchase transaction. The authorization code contains one or more fields. One such field is used to identify the vendor and thereby simplify the process of billing for the credit company. Another field provides the name and/or address of the credit card holder to reduce the effort of the ven-

dor for obtaining this data. Another field specifies the dollar limit of the amount of credit being authorized for this transaction. Another field specifies a limit of the time for which such credit is being allowed. Another field specifies the date and time of the authorization.

### Brief Description of the Drawing

FIG. 1 is a block diagram illustrating the operation of applicant's invention; and

FIG. 2 is a flow diagram of the steps of a method for implementing the invention.

### Detailed Description

FIG. 1 is a block diagram of the operation of applicant's invention. A purchaser at a calling station 1 is connected via a telecommunications network 2, such as the public switched telephone network, to a credit/debit card (CDC) data base 5. The calling station provides to the data base 5 a CDC number, a personal identification number (PIN), and a sample of the caller's voice. The sample is routed to caller verification system 7 which is used to recognize the voice and to ensure that the recognized voice corresponds to the specified credit/debit card. The caller is then provided with new dial tone and calls the vendor 3. The telephone number of the vendor is passed from network 2 to CDC data base 5 using signaling network 4. The identity of the vendor is the final piece of data required by the CDC data base to provide the authorization code. This authorization code is passed from CDC data base 5 via signaling network 4 and network 3 to vendor 3. In one specific implementation of applicant's invention, the authorization number is provided over a D-channel of an integrated services digital network (ISDN) link to the vendor. Alternatively, this information may be provided using other signaling techniques such as dual tone multifrequency (DTMF) signaling.

After the vendor has received the authorization code, the vendor is connected to the calling station and receives verbal instructions from the calling station. These verbal instructions, such as for merchandise to be ordered, are associated with the received authorization number and the vendor then transmits via network 2 and signaling network 4, the authorization code plus merchandise and charge information to the CDC data base 5 to charge the customer appropriately. The charge is valid only if the authorization code and the vendor identification correspond and any restrictions such as dollar limit and time limit are satisfied. The CDC company 6 is connected via the network and optionally via a data link to the CDC data base to allow the data base to be updated, for example, when a credit card is found to have been lost.

The authorization may be simply a positive indication to the vendor, but in the preferred embodiment,

the authorization includes an authorization code.

In accordance with one feature of the invention, the authorization indication comprises an authorization code for tracking a purchase transaction. The authorization code contains one or more fields. One such field is used to identify the vendor and thereby simplify the process of billing for the credit company. Another field provides the name and/or address of the credit card holder to reduce the effort of the vendor for obtaining this data. Another field specifies the dollar limit of the amount of credit being authorized for this transaction. Another field specifies a limit of the time for which such credit is being allowed. Another field specifies the date and time of the authorization.

FIG. 2 is a flow diagram of steps performed to practice applicant's invention. Initially, block 200, a CDC holder (CDCH) wants to make a teletransaction. Block 201 and its succeeding blocks illustrate a method wherein the CDCH initially calls the data base of a card company or its agent. Block 203 illustrates that the card company requests the card number, and a PIN or a voice sample, and validates the card and its user, this request may not be necessary if the caller's telephone station has been identified by an Automatic Number Identification (ANI) number forwarded to the data base, and matching the recorded telephone number for that CDC. The data base verifies the authorization of the CDC holder to incur the expense and prepares an authorization code for transmission to the vendor. If the CDCH is so authorized, the CDCH is then given a new dial tone and calls the vendor (block 205). Block 207 indicates that the CDCH orders the products/services from the vendor who has been automatically provided with the authorization code. Eventually, the CDCH disconnects (block 209) and the vendor charges against the card using the authorization code (block 211) if the transaction has been authorized and the time and dollar values are not exceeded. This can be performed either by the vendor filling out a credit ticket or by the vendor providing information which is immediately sent back as a data message to the CDC data base.

An alternate approach is illustrated in block 241 and its successors. Here the CDCH calls the vendor directly (action block 241). The vendor connects the CDCH to the card validator data base and the card validation is performed in a transaction between the calling station 1 and CDC data base 5. The transfer of calling station 1 to CDC data base 5 is performed by setting up a connection between the CDCH and the data base in such a way that it is impossible for the vendor to eavesdrop on this connection. The card is validated by the card validator using the card number, the PIN, and/or, if appropriate, voice recognition (action block 243). The CDCH is then returned to the vendor who is provided with an authorization code from the data base (action block 245). The CDCH then orders the products and the service against the

authorization code received by the vendor (action block 247) and the CDCH eventually hangs up (action block 249). The vendor charges against the CDC using the authorization code (action block 251).

Note that in both of these scenarios the credit/debit card number is not provided to the vendor who only receives the authorization code.

In another alternative arrangement, when a customer has selected his/her merchandise or service, the customer is connected to the CDC data base from a convenient station, possibly including a card reader, located in the vendor's store. After the CDC number has been entered and the transaction authorized, the authorization code is provided audibly or in video or printed form for the vendor, at the convenient station or at an associated terminal.

It is to be understood that the above description is only of one preferred embodiment of the invention. Numerous other arrangements may be devised by one skilled in the art without departing from the scope of the invention. The invention is thus limited only as defined in the accompanying claims.

## 25 Claims

1. In a data base (5) for authorizing a credit/debit card (CDC) expenditure, a method for authorizing a purchase of goods or services, comprising: responsive to receiving in said data base data (5) from a holder (1) identifying a specific CDC, determining whether said CDC is authorized to incur an expenditure; and responsive to a determination that said CDC is authorised to incur said expenditure, transmitting from said data base an authorization indication to a vendor (3) of said goods or services, the identification of said CDC not being derivable from said authorisation code; wherein the identification of said CDC is not provided to said vendor.
2. A method as claimed in claim 1 wherein said authorization indication comprises an authorisation code for tracking a purchase transaction.
3. A method as claimed in claim 2 wherein said authorisation code comprises one or more of the following: a limit of allowed expenditure for a transaction, an identification of said vendor, date and/or time data, a time limitation for a transaction, the name of a holder of said CDC, and an address of a holder of said CDC.
4. A method as claimed in claim 1, 2 or 3 wherein said data received in said data base comprises data for verifying the identity of the user of said CDC.

5. A method as claimed in claim 4 wherein said data for verifying comprises a personal identification number.
6. A method as claimed in claim 4 or 5 wherein said data for verifying comprises an automatic number identification of a caller station supplying said CDC identification, 5
7. A method as claimed in any preceding claim comprising the steps of: 10
- establishing a voice connection to voice recognition means for recognizing the identity of a caller; and
- using output of said voice recognition means to identify a user of said CDC. 15

20

25

30

35

40

45

50

55

4

FIG. 1

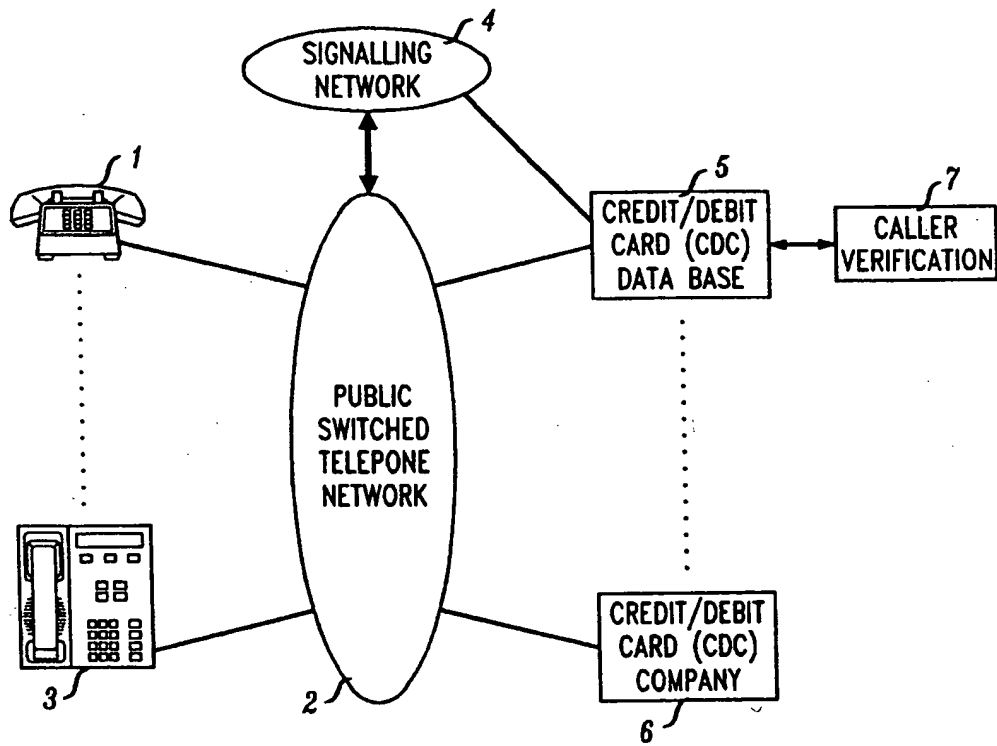
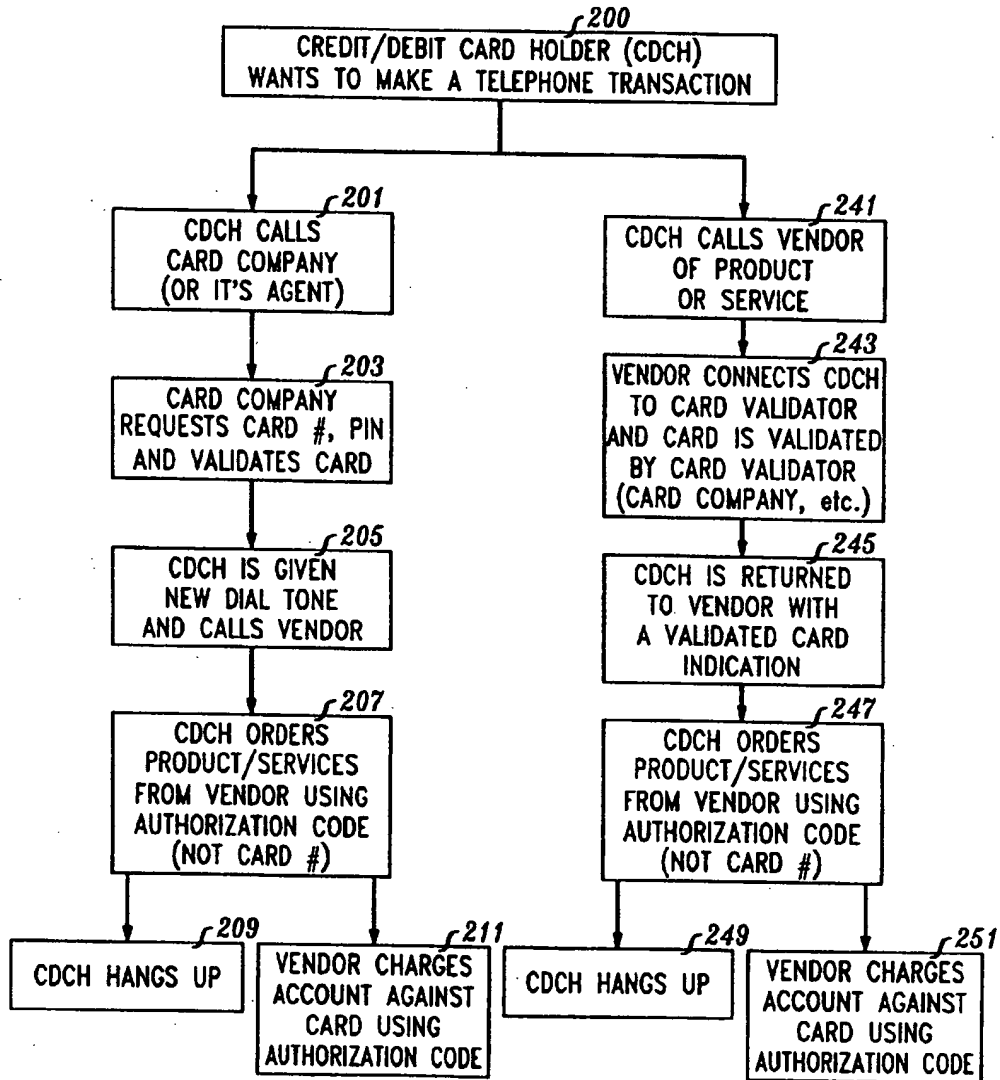


FIG. 2



**PCT**WORLD INTELLECTUAL PROPERTY ORGANIZATION  
International Bureau

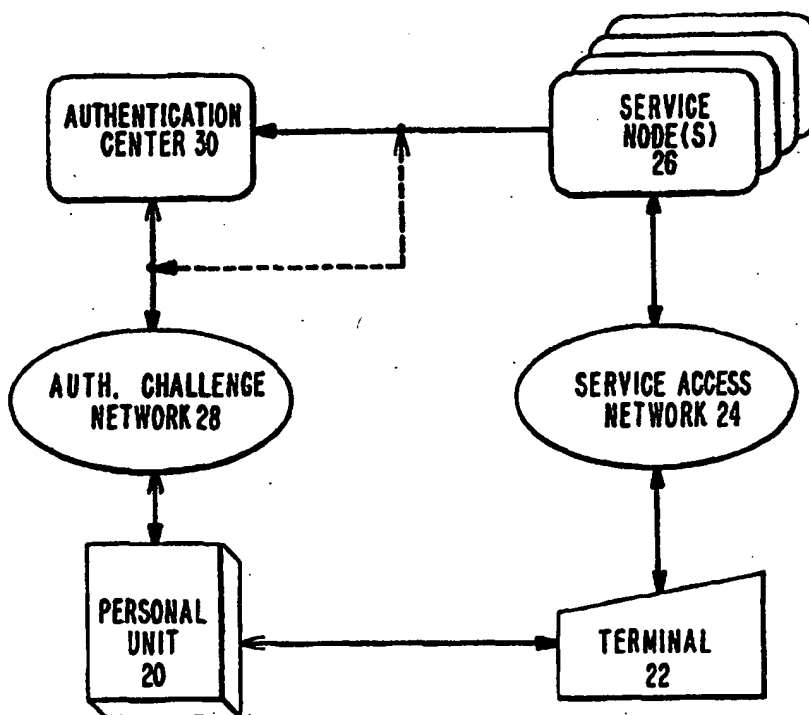
## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> : <b>H04Q 7/38, H04L 9/32</b>		<b>A3</b>	(11) International Publication Number: <b>WO 96/00485</b>
			(43) International Publication Date: 4 January 1996 (04.01.96)
(21) International Application Number: <b>PCT/SE95/00719</b>		(81) Designated States: AM, AT, AU, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LU, LV, MD, MG, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TT, UA, UG, UZ, VN, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG), ARIPO patent (KE, MW, SD, SZ, UG).	
(22) International Filing Date: 14 June 1995 (14.06.95)			
(30) Priority Data: 08/264,939                      24 June 1994 (24.06.94)                      US			
(71) Applicant: <b>TELEFONAKTIEBOLAGET LM ERICSSON</b> [SE/SE]; S-126 25 Stockholm (SE).		<b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>	
(72) Inventors: <b>JONSSON, Björn, Erik, Rutger</b> ; Dimvägen 36, S-175 38 Järfälla (SE). <b>FALK, Johan, Per</b> ; Gustav Trolles Väge 4, S-175 76 Järfälla (SE).			
(74) Agents: <b>BÖHLIN, Björn et al.</b> ; Telefonaktiebolaget LM Ericsson, Patent Dept., S-126 25 Stockholm (SE).			
		(88) Date of publication of the international search report: 25 January 1996 (25.01.96)	

(54) Title: **USER AUTHENTICATION METHOD AND APPARATUS**

## (57) Abstract

Authorization for a user to use a service is provided by a modified pager which calculates a unique response code to a transmitted challenge code based on the challenge code, an input personal identification number, and an internal key. The response code is input to a simple terminal, such as a telephone and if the unique response code is acceptable, the user may access the desired service, such as cashless transactions or long distance phone service.



**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	GB	United Kingdom	MR	Mauritania
AU	Australia	GE	Georgia	MW	Malawi
BB	Barbados	GN	Guinea	NE	Niger
BE	Belgium	GR	Greece	NL	Netherlands
BF	Burkina Faso	HU	Hungary	NO	Norway
BG	Bulgaria	IE	Ireland	NZ	New Zealand
BJ	Benin	IT	Italy	PL	Poland
BR	Brazil	JP	Japan	PT	Portugal
BY	Belarus	KE	Kenya	RO	Romania
CA	Canada	KG	Kyrgyzstan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo	KR	Republic of Korea	SE	Sweden
CH	Switzerland	KZ	Kazakhstan	SI	Slovenia
CI	Côte d'Ivoire	LI	Liechtenstein	SK	Slovakia
CM	Cameroon	LK	Sri Lanka	SN	Senegal
CN	China	LU	Luxembourg	TD	Chad
CS	Czechoslovakia	LV	Latvia	TG	Togo
CZ	Czech Republic	MC	Monaco	TJ	Tajikistan
DE	Germany	MD	Republic of Moldova	TT	Trinidad and Tobago
DK	Denmark	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	US	United States of America
FI	Finland	MN	Mongolia	UZ	Uzbekistan
FR	France			VN	Viet Nam
GA	Gabon				



1

**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/SE 95/00719

**A. CLASSIFICATION OF SUBJECT MATTER**

IPC6: H04Q 7/38, H04L 9/32

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC6: H04Q, H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, CLAIMS

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2190820 A (RACAL-GUARDATA LIMITED), 25 November 1987 (25.11.87), page 1, line 100 - page 2, line 113	1,2,4,5
Y	--	3,6-36
P,Y	EP 0650307 A2 (KABUSHIKI KAISHA TOSHIBA), 26 April 1995 (26.04.95), column 2, line 31 - line 45	3
X	WO 9317529 A1 (NOKIA TELECOMMUNICATIONS OY), 2 Sept 1993 (02.09.93), page 11, line 20 - page 12, line 2	1
Y	page 6, line 10 - page 14, line 23	6-36
	--	

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

18 December 1995

Date of mailing of the international search report

27.12.1995

Name and mailing address of the ISA/  
Swedish Patent Office  
Box 5055, S-102 42 STOCKHOLM  
Facsimile No. +46 8 666 02 86

Authorized officer

Håkan Sandh  
Telephone No. +46 8 782 25 00

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/SE 95/00719

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0506637 A2 (ERICSSON - GE MOBILE COMMUNICATIONS INC.), 30 Sept 1992 (30.09.92), page 12, line 19 - line 52  -----	1

**INTERNATIONAL SEARCH REPORT**  
Information on patent family members

11/12/95

International application No.  
PCT/SE 95/00719

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB-A- 2190820	25/11/87	AU-B,B- 590082	26/10/89
		AU-A- 7326487	26/11/87
		EP-A,A,A 0246823	25/11/87
		JP-A- 63010839	18/01/88
		US-A- 4890323	26/12/89
EP-A2- 0650307	26/04/95	NONE	
WO-A1- 9317529	02/09/93	AU-B- 657396	09/03/95
		AU-A- 3501793	13/09/93
		EP-A- 0583452	23/02/94
		JP-T- 6507293	11/08/94
		NO-A- 933808	22/10/93
EP-A2- 0506637	30/09/92	US-A- 5237612	17/08/93